FORM PTO-1390 (Modified) (REV 11-2000) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER: **30893-1059**

U.S. APPLICATION NO (IF KNOWN, SEE 37 CFR 1.5): 09/980462

INTERNATIONAL APPLICATION NO	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/NL00/00371	**30 May 2000 (30.05.00)**	**31 May 1999 (31.05.99)**

TITLE OF INVENTION

APPARATUS FOR MEASURING A SMALL QUANTITY OF A LIQUID

APPLICANT(S) FOR DO/EO/US

Michael Johannes VELLEKOOP Kari Tapani HJELT and Gerrit Wijnand LUBKING

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U S.C 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S C 371(f)). The submission must include items (5), (6), (9) and (24) indicated below
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31)
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
   a. ☐ is attached hereto (required only if not communicated by the International Bureau).
   b. ☒ has been communicated by the International Bureau.
   c ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S C 371(c)(2)).
   a. ☐ is attached hereto
   b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S C 371 (c)(3))
   a. ☐ are attached hereto (required only if not communicated by the International Bureau).
   b. ☒ have been communicated by the International Bureau
   c. ☐ have not been made, however, the time limit for making such amendments has NOT expired
   d ☐ have not been made and will not be made
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U S.C 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S C. 371 (c)(4)).
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).
11. ☐ A copy of the International Preliminary Examination Report (PCT/IPEA/409)
12. ☐ A copy of the International Search Report (PCT/ISA/210)

Items 13 to 20 below concern document(s) or information included:

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1 98
14. ☐ An assignment document for recording A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U S C. 1 821 - 1 825.
20. ☐ A second copy of the published international application under 35 U S.C. 154(d)(4).
21. ☐ A second copy of the English language translation of the international application under 35 U.S C 154(d)(4).
22. ☒ Certificate of Mailing by Express Mail
23. ☒ Other items or information.

Unsigned Declaration and Power of Attorney for Patent Application
Associate Power of Attorney

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 1.5)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
09/980462	PCT/NL00/00371	30893-1059

24. The following fees are submitted

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

		CALCULATIONS PTO USE ONLY
☐	Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO	**$1040.00**
☒	International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO	**$890.00**
☐	International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO	**$740.00**
☐	International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4)	**$710.00**
☐	International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4)	**$100.00**

ENTER APPROPRIATE BASIC FEE AMOUNT =	**$890.00**	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).	**$0.00**	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	13 - 20 =	0	x $18.00	**$0.00**	
Independent claims	1 - 3 =	0	x $84.00	**$0.00**	
Multiple Dependent Claims **(check if applicable)**.			☐	**$0.00**	
TOTAL OF ABOVE CALCULATIONS =				**$890.00**	
☒ Applicant claims small entity status. See 37 CFR 1.27). The fees indicated above are reduced by 1/2.				**$445.00**	
SUBTOTAL =				**$445.00**	
Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)) +				**$0.00**	
TOTAL NATIONAL FEE =				**$445.00**	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) **(check if applicable).** ☐				**$0.00**	
TOTAL FEES ENCLOSED =				**$445.00**	
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a. ☒ A check in the amount of **$445.00** to cover the above fees is enclosed

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d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO

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35,964
REGISTRATION NUMBER

November 30, 2001
DATE

I hereby certify that this paper is being deposited with the United States Postal Service on **30 November 2001**, in an envelope as "Express Mail Post Office to Addressee" mailing Label No **EV003480266US** addressed to Box PCT, Commissioner for Patents, P. O. Box 2327, Arlington VA 20202.

Annette M. Turk, Legal Assistant — 30 November 2001 (Date)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Michael Johannes Vellekoop Kari Tapani Hjelt and Gerrit Wijnand Lubking	
Serial No.: UNKNOWN		Examiner: UNKNOWN
Priority claimed to PCT/NL00/00371		
Filed: Herewith (30 November 2001)		Group Art Unit: UNKNOWN
For:	APPARATUS FOR MEASURING A SMALL QUANTITY OF A LIQUID	

FIRST PRELIMINARY AMENDMENT

Box: PCT
Commissioner for Patents
Washington, D.C. 20231

Sir:

Please amend the application, without prejudice, as follows:

In the Claims:

Amend Claims 1-11 as follows:

1. An apparatus for measuring a volume of a quantity of a liquid, comprising at least one chamber for receiving the liquid, which chamber comprises a bottom and upright side walls and at least two electrodes to connect to a voltage source and to a measuring system for determining the electrical impedance between the electrodes, wherein the electrodes are incorporated in the bottom of the chamber, allowing the electrical impedance of the liquid itself to be determined.

2. An apparatus according to claim 1, wherein the bottom of the chamber is substantially formed by a glass substrate.

3. An apparatus according to claim 2, wherein the electrodes are provided on the glass substrate, and are embedded in an insulation layer provided on the glass substrate.

4. An apparatus according to claim 3, wherein the upright side walls are formed by etching insulation material provided on the insulation layer.

5. An apparatus according to claim 1, wherein the bottom of the chamber is substantially formed by a silicon wafer.

6. An apparatus according to claim 5, wherein the silicon wafer is provided with a first insulation layer.

7. An apparatus according to claim 6, wherein the electrodes are provided on the first insulation layer of the silicon wafer and are embedded in a second insulation layer, which is provided on the first insulation layer.

8. An apparatus according to claim 7, wherein the upright side walls are formed by etching insulation material provided on the second insulation layer.

9. An apparatus according to claim 1, wherein the volume of said at least one chamber is maximally 2 nanolitres.

10. An apparatus according to claim 1, wherein said apparatus comprises a plurality of chambers arranged in an array.

11. An apparatus according to claim 1, wherein said apparatus is connected to an alternating voltage source having a frequency of at least approximately 15 kHz.

Add new claims 13-14 as follows:

12. An apparatus according to claim 6, wherein said first insulation layer comprises SiO_2.

13. An apparatus according to claim 7, wherein said second insulation layer comprises Si_xN_y.

REMARKS

The foregoing amendment to the claims is being offered in a format acceptable to the U.S. Patent and Trademark Office. The amendment of the claims incorporates those changes occurring during the Chapter II phase of the corresponding PCT application. No new matter is presented by this Amendment. Entry of this amendment by the Examiner is respectfully requested.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached paper is captioned "**Version with Markings to Show Changes Made**."

Authorization is given to charge payment of any fees required, or credit any overpayment, to Deposit Acct. 13-4213. A duplicate of this paper is enclosed for accounting purposes.

Respectfully submitted,

Dated: 30 November 2001

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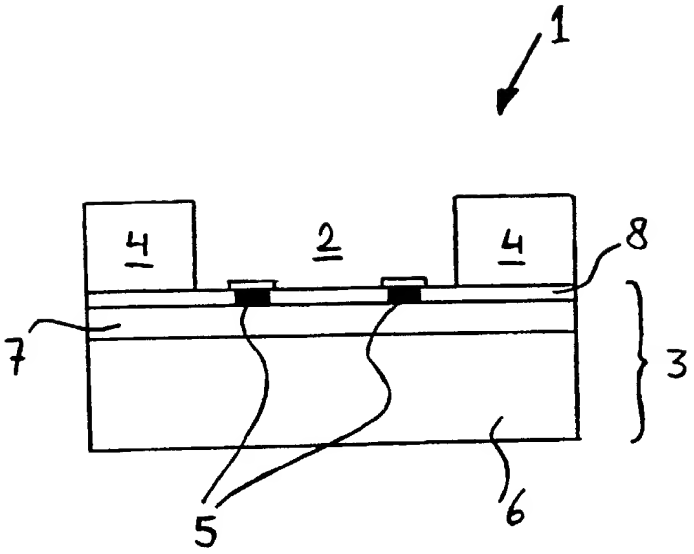

FIG. 1

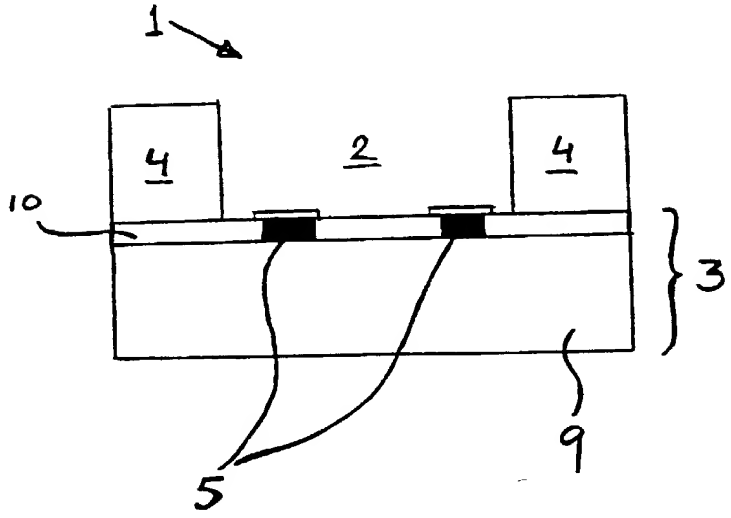

FIG. 2

Version with Markings to Show Changes Made

1. (Twice Amended) An apparatus [(1)] for measuring a volume of a quantity of a liquid, [for example, in connection with a medical diagnostic test,] comprising at least one chamber [(2)] for receiving the liquid, which chamber [(2)] comprises a bottom [(3)] and upright side walls [(4)] and at least two electrodes [(5)] to connect to a voltage source and to a measuring system for determining the electrical impedance between the electrodes, [characterized in that] wherein the electrodes are incorporated in the bottom [(3)] of the chamber [(2)], allowing the electrical impedance of the liquid itself to be determined.

2. (Amended) An apparatus according to claim 1, [characterized in that] wherein the bottom [(3)] of the chamber [(2)] is substantially formed by a glass substrate [(9)].

3. (Amended) An apparatus according to claim 2, [characterized in that] wherein the electrodes [(5)] are provided on the glass substrate [(9)], and are embedded in an insulation layer [(10)] provided on the glass substrate [(9)].

4. (Twice Amended) An apparatus according to [the] claim 3, [characterized in that] wherein the upright side walls [(4)] are formed by etching insulation material provided on the insulation layer [(10)].

5. (Amended) An apparatus according to claim 1, [characterized in that] wherein the bottom [(3)] of the chamber [(2)] is substantially formed by a silicon wafer [(6)].

6. (Amended) An apparatus according to claim 5, [characterized in that] wherein the silicon wafer [(6)] is provided with a first insulation layer [(7), preferably of SiO_2].

7. (Amended) An apparatus according to claim 6, [characterized in that] wherein the electrodes [(5)] are provided on the first insulation layer [(7)] of the silicon wafer [(6)] and are embedded in a second insulation layer [(8)], [preferably $Si_x N_y$,] which is provided on the first insulation layer [(7)].

8. (Twice Amended) An apparatus according to claim 7, [characterized in that] wherein the upright side walls [(4)] are formed by etching insulation material provided on the second insulation layer [(8)].

9. (Amended) An apparatus according to [one of the preceding claims] claim 1, [characterized in that] wherein the volume of said at least one chamber [(2)] is maximally 2 nanolitres.

10. (Twice Amended) An apparatus according to [one of the claims 1-9, characterized in that] claim 1, wherein said apparatus [the same] comprises a plurality of chambers [(2)] arranged in an array.

11. (Amended) An apparatus [for measuring a quantity of liquid] according to [one of the preceding claims, characterized in that] claim 1, wherein said apparatus [it] is connected to an alternating voltage source having a frequency of at least approximately 15 kHz.

Add new claims:

--12. An apparatus according to claim 6, wherein said first insulation layer comprises SiO_2.

13. An apparatus according to claim 7, wherein said second insulation layer comprises Si_xN_y.--

WO 800142-VB/LM

(83)

Apparatus for measuring a small quantity of a liquid

The invention relates to an apparatus for measuring a volume of a quantity of a liquid, for example, in connection with a medical diagnostic test, comprising at least one chamber for receiving the liquid, which chamber comprises a bottom and upright side walls and at least two electrodes to connect to a voltage source and to a measuring system for determining the electrical impedance between the electrodes.

Such an apparatus is known from the international patent application WO96/24030 (PCT/US96/00611). The prior art apparatus possesses a chamber with side walls provided with electrodes. The drawback of this known apparatus, which is used, for example, for performing medical diagnostic tests on blood or the like is that the chamber for receiving the liquid has a rather large volume. This is a disadvantage since as a consequence such an apparatus, which is not only used for medical diagnostic purposes but is also applied in fine-chemical and pharmaceutical test arrays, uses large amounts of liquid. Such liquids as, for instance biochemical receptors, are costly, as a result of which it has long been endeavoured to make the type of apparatus described in the preamble smaller, especially in respect of the chamber volume. Such smaller volumes have the additional advantage of speeding up reaction rates of the liquids introduced into the apparatus, due to the reduced diffusion distances and the physical limitations inherent to a smaller chamber volume. Accordingly, the importance of precisely measuring the amount of liquid increases, as with (very) small test volumes small deviations will easily lead to inaccurate test results. With the miniaturization of the chamber that is part of such an apparatus, the problem arises that it is difficult to incorporate the electrodes into the side walls of the cham-

ber. Moreover, a precise measurement of the volume is then no longer possible.

It is the object of the invention therefore to provide an apparatus of the kind mentioned in the preamble, that can be miniaturized to a significant extent, that makes it possible to precisely measure the liquid volume in the chamber, that can be fabricated at low costs, and that is suitable for use in automized test procedures.

To this end the apparatus according to the invention is characterized in that the electrodes are substantially incorporated in the bottom of the chamber, allowing the electrical impedance of the liquid itself to be determined.

Surprisingly it has been shown, that by using the apparatus according to the invention it is possible to perform very precise volume measurements of the liquid in the chamber, while even the presence of a concave or convex meniscus on the liquid hardly has any negative effect on the accuracy of the measurement. Applicant believes to be able to explain this through the measurement being based on a totally different principle compared with the method of measurement using the apparatus disclosed in WO 96/24030, although the two appear to bear some relationship to one another. In the prior art apparatus, the volume is measured indirectly due to the electrical transfer between the electrode plates being influenced by the level of liquid between them, but also by the degree of electrical coupling of the electrodes to the liquid. However, in the invention an impedance measurement of the liquid itself takes place, and the degree of electrical coupling of the electrodes to the liquid is invariant with regard to the amount of liquid present in the chamber.

It is observed that from WO 98/03841 (PCT/US97/12866) a capacitive water level gauge is known wherein two electrodes are incorporated in the bottom. However, this publication is not concerned with measuring a water volume, nor is it possible to use the apparatus

disclosed in this publication for a medical diagnostic test, in which it is important to be able to measure a small amount of liquid.

A first advantageous embodiment of the apparatus according to the invention is characterized in that the bottom of the chamber is substantially formed by a glass substrate. This affords the advantage that no steps need to be taken to electrically insulate the electrodes with respect to the substrate. Preferably the electrodes are then provided on the glass substrate, and are embedded in an insulation layer provided on the glass substrate.

A second advantageous embodiment of the apparatus according to the invention is characterized in that the bottom of the chamber is substantially formed by a silicon wafer. On this basis the apparatus can be fabricated at low costs, the chamber of the apparatus can be given a precise volume, while the same can be conveniently embodied by applying the appropriate semiconductor technology for direct coupling with an automatic, possibly computerized, measuring system.

Desirably in this embodiment, the silicon wafer is provided with a first insulation layer, preferably of SiO_2. This electrically insulates the electrodes with respect to the wafer, and further reduces the undesirable capacitive coupling of the electrodes to the silicon wafer.

It is further desirable for the electrodes to be provided on the first insulation layer of the silicon wafer and for them to be embedded in a second insulation layer, preferably Si_xN_y, which is provided on the first insulation layer. In this way the electrodes are prevented from being galvanically coupled with the liquid to be introduced into the chamber.

It is further advantageous that the upright side walls are formed by etching insulation material provided on the second insulation layer. Production-technically this can be realized quite easily.

The invention provides an apparatus which, in a preferred variant, is characterized in that the chamber is equipped to receive liquid up to an amount of maximally 2 nanolitres.

In addition the invention has the advantage that in a desirable embodiment it can be fabricated such that it comprises a plurality of chambers arranged in an array. This is very convenient for performing extensive testing procedures.

The invention is further embodied in a method for measuring a quantity of liquid using the apparatus according to the invention, and is characterized in that the voltage source is an alternating voltage source having a frequency of at least approximately 15 kHz. The advantage of this measure is that the effect of the coupling capacity between the electrodes and the liquid is negligible, which contributes to the precision in measuring the quantity of liquid introduced into the chamber.

The invention will now be further explained with reference to the drawing, which

in Figure 1, shows a schematic cross section of a first embodiment of the apparatus according to the invention; and

in Figure 2, shows a schematic cross section of a second embodiment of the apparatus according to the invention.

Identical reference numbers used in the Figures refer to similar parts.

In the Figures 1 and 2 the apparatus is generally indicated with reference number 1. Liquid whose volume is to be measured may be introduced into the chamber 2 of the apparatus. This chamber 2 comprises a bottom 3 and upright side walls 4. Further, electrodes 5 are provided which are incorporated in the bottom 3 of the chamber 2. Via electric cables (not shown), the electrodes 5 can be connected to a voltage source and a measuring system in a manner with which the person skilled in the art is fully acquainted, which electrodes serve to determine the electri-

cal impedance between the electrodes 5 as it is being formed by the liquid to be introduced into the chamber 2.

A first embodiment of the apparatus according to the invention will now be elucidated with reference to Figure 1. The bottom 3 of the chamber 2 is substantially formed by a silicon wafer 6. The silicon wafer 6 is provided with a first insulation layer 7, which is preferably SiO_2. The electrodes 5 are provided on the first insulation layer 7 of the silicon wafer 6, and embedded in a second insulation layer 8, preferably Si_xN_y, which is provided on the first insulation layer 7. The upright side walls 4 finally are preferably formed by etching insulation material applied to the second insulation layer 8. For this purpose it is convenient to use, for example, SiO_2.

Figure 2, shows a second embodiment of the apparatus according to the invention. In this embodiment the main portion of the bottom 3 is formed by a glass substrate 9. The electrodes 5 are provided on the glass substrate 9, being embedded in an insulation layer 10. Again, any suitable material may be used for the insulation layer 10 such as, for example, Si_xN_y. In this second embodiment finally, the upright walls 4 are also preferably formed by etching the insulation material applied to the insulation layer 10.

Although for the sake of clarity the invention is explained in an embodiment comprising only one chamber 2, it should be appreciated that the apparatus according to the invention may also be embodied comprising a plurality of adjacently arrayed chambers 2, which appropriately may, for example, have the following dimensions. The dimensions of the array may be 5 by 5 mm^2, possibly comprising eight by twelve (= 96) chambers 2, having a width, length and height of 200 μm, 200 μm, and 6-40 μm, respectively. The liquid volume that such a chamber 2 can contain is approximately 0.2-1.5 nanolitres. The first insulation layer 7 of the apparatus 1 then has, for example, a thickness of 2 μm. The electrodes 5 may be of aluminium, of a thickness

of 300 nanometres, and covered with a 500-nanometres-thick Si_xN_y layer.

The preceding discussion and dimensional examples should be understood as being non-limitative exemplary embodiments. The protective scope of the invention is determined exclusively by the appended claims. The preceding discussion merely serves to elucidate said claims.

CLAIMS

1. An apparatus (1) for measuring a volume of a quantity of a liquid, for example, in connection with a medical diagnostic test, comprising at least one chamber (2) for receiving the liquid, which chamber (2) comprises a bottom (3) and upright side walls (4) and at least two electrodes (5) to connect to a voltage source and to a measuring system for determining the electrical impedance between the electrodes, **characterized** in that the electrodes are incorporated in the bottom (3) of the chamber (2), allowing the electrical impedance of the liquid itself to be determined.

2. An apparatus according to claim 1, **characterized** in that the bottom (3) of the chamber (2) is substantially formed by a glass substrate (9).

3. An apparatus according to claim 2, **characterized** in that the electrodes (5) are provided on the glass substrate (9), and are embedded in an insulation layer (10) provided on the glass substrate (9).

4. An apparatus according to the claim 3, **characterized** in that the upright side walls (4) are formed by etching insulation material provided on the insulation layer (10).

5. An apparatus according to claim 1, **characterized** in that the bottom (3) of the chamber (2) is substantially formed by a silicon wafer (6).

6. An apparatus according to claim 5, **characterized** in that the silicon wafer (6) is provided with a first insulation layer (7), preferably of SiO_2.

7. An apparatus according to claim 6, **characterized** in that the electrodes (5) are provided on the first insulation layer (7) of the silicon wafer (6) and are embedded in a second insulation layer (8), preferably Si_xN_y, which is provided on the first insulation layer (7).

8. An apparatus according to claim 7, **characterized** in that the upright side walls (4) are formed by

etching insulation material provided on the second insulation layer (8).

9. An apparatus according to one of the preceding claims, **characterized** in that the volume of chamber (2) is maximally 2 nanolitres.

10. An apparatus according to any one of the claims 1-9, **characterized** in that the same comprises a plurality of chambers (2) arranged in an array.

11. An apparatus for measuring a quantity of liquid according to one of the preceding claims, **characterized** in that it is connected to an alternating voltage source having a frequency of at least approximately 15 kHz.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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Published:
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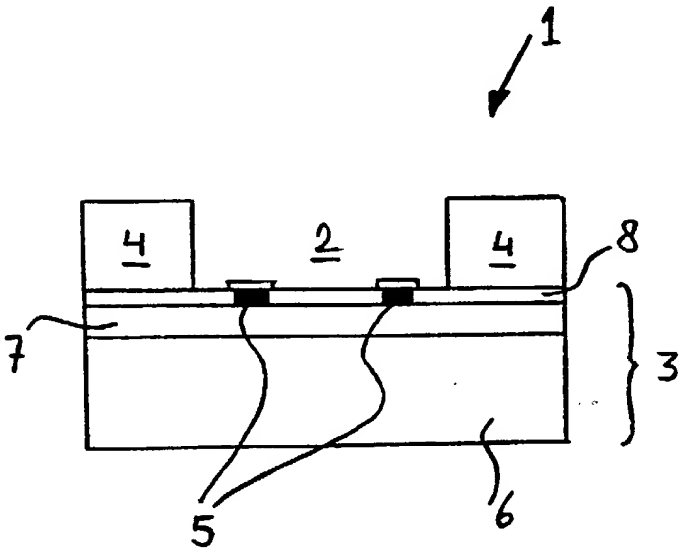
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: APPARATUS FOR MEASURING A SMALL QUANTITY OF A LIQUID



(57) Abstract: An apparatus for measuring a small quantity of a liquid, for example, in connection with a medical diagnostic test, comprising at least one chamber for receiving the liquid, which chamber comprises a bottom and upright side walls and at least two electrodes to connect to a voltage source and a measuring system for determining the electrical impedance between the electrodes. The electrodes are substantially incorporated in the bottom of the chamber, allowing the electrical impedance of the liquid itself to be determined.

WO 00/73746 A1

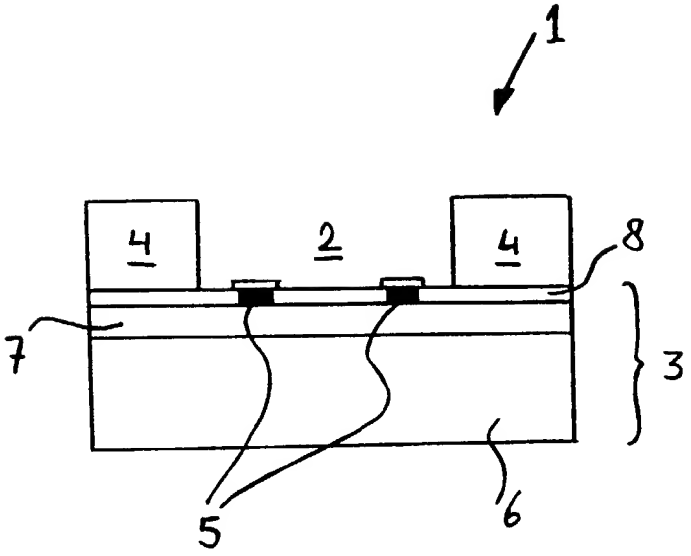


FIG. 1

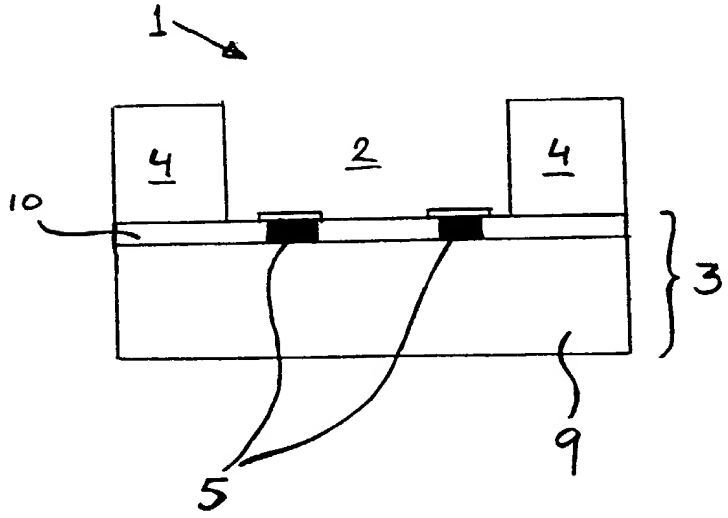


FIG. 2

Docket No.
30893-1059

Declaration and Power of Attorney For Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled
APPARATUS FOR MEASURING A SMALL QUANTITY OF LIQUID

the specification of which

(check one)

☐ is attached hereto.

☒ was filed on November 20, 2001 as United States Application No. or PCT International Application Number 09/980,462

and was amended on _____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)			Priority Not Claimed
PCT/NL/00/00371	PCT	30 MAY 2000	☐
(Number)	(Country)	(Day/Month/Year Filed)	
NL 1012197	Netherlands	31 MAY 1999	☐
(Number)	(Country)	(Day/Month/Year Filed)	
			☐
(Number)	(Country)	(Day/Month/Year Filed)	

I hereby claim the benefit under 35 U.S.C Section 119(e) of any United States provisional application(s) listed below:

(Application Serial No.)	(Filing Date)
(Application Serial No.)	(Filing Date)
(Application Serial No.)	(Filing Date)

I hereby claim the benefit under 35 U. S. C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C. F. R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)
(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)
(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. *(list name and registration number)*

JEFFREY D. MYERS. Reg. No. 35,964

Send Correspondence to:

Direct Telephone Calls to: *(name and telephone number)*

Jeffrey D. Myers (505) 998-1502

1.

Full name of sole or first inventor
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Sole or first inventor's signature

Date February 19, 2002

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2.

Full name of second inventor, if any
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Second inventor's signature

Date February 19, 2002

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~~02200 Helsinki, Finland~~ 02750 Espoo, Finland

Executor:

Full name of third inventor, if any Gerrit Wijnand LUBKING Deceased year ~~2007~~ 2008	
Third inventor's signature	Date 15-7-2002
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Full name of fourth inventor, if any	
Fourth inventor's signature	Date
Residence	
Citizenship	
Post Office Address	

Full name of fifth inventor, if any	
Fifth inventor's signature	Date
Residence	
Citizenship	
Post Office Address	

Full name of sixth inventor, if any	
Sixth inventor's signature	Date
Residence	
Citizenship	
Post Office Address	

123/5201993/cvl
Legalisation mr. G.Y. Warries
Version 17th July 2002

Seen for legalisation the signature of:

mr. Gerrit Yko Warries, born on the twenty-fourth of November nineteenhundred fifty-two in Amsterdam (The Netherlands), residing at Utrecht (The Netherlands) holder of a Dutch drivers licence, number 3162894658,

acting in his capacity of administrator of the inheritance of mr. Gerrit Wijnand Lubking, born on the twenty-eighth of May nineteenhundred fourty-four in Rotterdam (The Netherlands), who died on the eighteenth of December twothousand in Schiplulden (The Netherlands),

according, to an attestation of admissibility tot the estate, issued by a substitute of mr. Wilhelmus Petrus Looijaard, sollicitor and civil law notary in Rotterdam (The Netherlands) on the thirty-first of May twothousandtwo,

by me, mr. Robbert Alexander Gallas, sollicitor and civil law notary, residing at The Hague, The Netherlands, on this day, the seventeenth of July twothousandtwo.

Mr R. A. GALLAS
NOTARIS TE 's-GRAVENHAGE